(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 October 2002 (31.10.2002)

PCT

(10) International Publication Number
WO 02/087239 A1

(51) International Patent Classification[7]: H04N 7/16

(21) International Application Number: PCT/US02/12379

(22) International Filing Date: 18 April 2002 (18.04.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/840,326 23 April 2001 (23.04.2001) US

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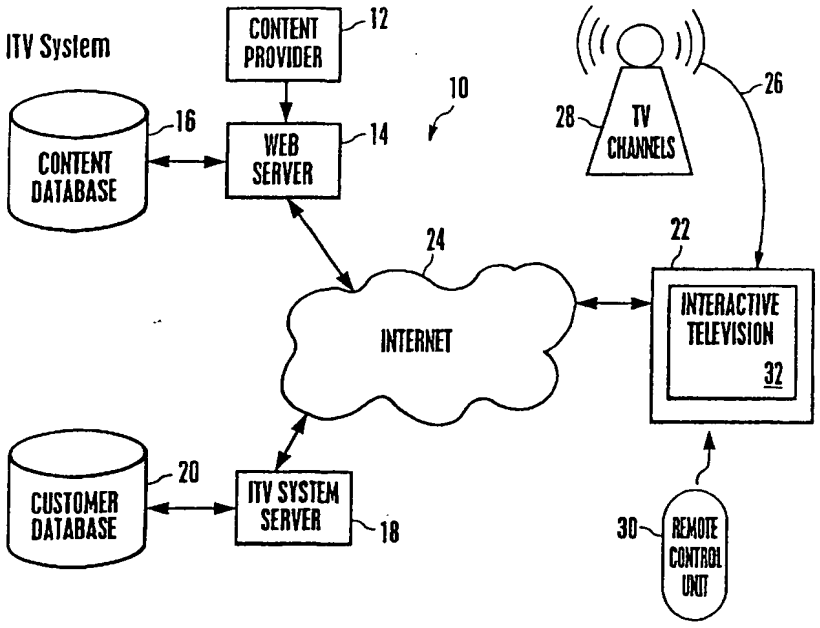
(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PULLING INTERNET CONTENT ONTO INTERACTIVE TELEVISION USING USAGE DATA



(57) Abstract: A method for pulling Internet content onto an interactive television (22) includes monitoring usage of the interactive television system (10) by each consumer. For each consumer, a pattern of usage is established. The ITV system (10) predicts future usage times based on prior usage patterns. Accordingly, the ITV system (10) downloads content relevant to the usage on or about the predicted time of usage. Thus, the time that the consumer must to wait to receive the content is minimized.

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PULLING INTERNET CONTENT ONTO INTERACTIVE TELEVISION USING USAGE DATA

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to television systems.

2. Description of the Related Art

Televisions are ubiquitous, as are Internet computers. Currently, however, consumers typically purchase and use two separate systems to enjoy television and Internet access. Namely, consumers must purchase a television to watch television, and a computer to access the Internet. One result not only is that costs are duplicated and significant space is required, but also that undertaking both activities at once, in one room, can be difficult.

Moreover, the need for two systems burdens some consumers who, while familiar with operating a television and its remote control, might not be familiar with operating an Internet computer. Nonetheless, while perhaps not requiring comprehensive Internet support, such consumers can still benefit from advantages provided by simple, straightforward, intuitive Internet interaction. For example, many consumers might only desire easy access to a weather site or traffic site for obtaining up-to-date information before proceeding to work in the morning, without having to know a great deal about how to operate a Web browser. As recognized herein, it consequently would be advantageous to provide an Internet access appliance that is easy and intuitive to use, for instance one that could be used like a television remote control.

To the extent that attempts have been made to combine television with Internet features, the above-noted consumer needs have remained unfulfilled. For instance, in the system known as "WebTV", preselected Internet pages are loaded once into a television during manufacture and never subsequently updated, with the preselected pages being accessible through the television using a computer keyboard with its attendant complexity. Since the pages are not updated, however, many Internet-related features such as up-to-date traffic, weather, and news, are not immediately available. Instead, the consumer must access a central site using one of the preselected pages, and then be redirected to a desired Web page. In terms of currently expected speeds of Internet access, this consumes an undue amount of time. Furthermore, it requires browser or browser-like operations that must be initiated by a consumer who might only wish to turn on the television and immediately access up-to-date information using the relatively simple TV remote control without further ado.

Still further, current systems provide the same preselected Web pages to all consumers. As understood herein, it would be advantageous to tailor, for each consumer, what Web pages are provided in a television to that particular consumer. In this way, a consumer is much more likely to gain useful and enjoyable Internet access than he or she would be able to gain otherwise.

Additionally, as mentioned above, in the above-mentioned WebTV system, a keyboard is required for user input to access Web sites. For television functions, however, consumers are accustomed to using a much simpler input device, namely, a remote control. Thus, existing systems that attempt to integrate

television and Internet computers do not do so seamlessly, but rather require the operation of two separate systems that happen to be housed together and that require two separate input devices. This complicates matters for the consumer, and is confusing. The object of the present invention is to address one or more of the above-noted consumer needs.

SUMMARY OF THE INVENTION

A method for providing Internet content via an interactive television system includes monitoring usage of the interactive television system. Content access patterns are established for each consumer using the system. Access times are predicted based on the content access patterns and content is downloaded based on the predicted access times.

In another aspect of the present invention, a method for providing Internet content via an interactive television system includes monitoring usage of the interactive television system. Usage patterns are established for consumers using the system. Future times of usage are predicted based on the usage patterns and content relevant to the usage is downloaded based on the predicted times of usage.

In a preferred embodiment, the usage by the consumer is monitored to establish content access patterns. Access times are predicted based on the content access patterns. Moreover, content is downloaded based on the predicted access time.

In another aspect, the usage by the consumer is monitored to establish start-up patterns and shut-down patterns. Future start-up times and future shut-

down times are predicted based on use patterns, and content relevant to a gateway screen is downloaded based on the predicted start-up and shut-down times.

In still another aspect, the usage by the consumer is monitored to establish request for content patterns. Future request times are predicted based on the request for content patterns, and the consumer is prompted to accept content based on the predicted request times. If the consumer accepts the prompt, the content is downloaded.

In yet another aspect of the present invention, an interactive television system includes a Web server having Internet content stored therein, an interactive television system server, and an interactive television. In this aspect, the interactive television receives Internet content from the Web server. Moreover, the interactive television system server includes a program for downloading content to the interactive television at predicted times.

In still another aspect of the present invention, a method for providing Internet content via an interactive television system includes predicting times of usage for consumers using the system. Content relevant to the usage is downloaded based on the predicted times of usage.

In yet still another aspect of the present invention, a method for providing Internet content via an interactive television system includes monitoring usage of the interactive television system. Usage patterns are established for consumers using the system. In this aspect, content sources are predicted based on the

usage patterns. Additionally, content from the predicted content sources is downloaded based on the usage patterns.

BRIEF DESCRIPTION OF THE DRAWINGS

The details of the present invention, both as to its structure and operation, can best be understood in reference to the accompanying drawings, in which like reference numerals refer to like parts, and in which:

Figure 1 is a block diagram of the interactive television (ITV) system of the present invention;

Figure 2 is a block diagram of the ITV of the present invention;

Figure 3 is a flow chart of the overall method of the present invention;

Figure 4 is a flow chart of the method for establishing and/or changing virtual channels;

Figure 5 is a flow chart of the gateway screen logic;

Figure 6 is a schematic representation of the gateway screen;

Figure 7 is a flow chart of the logic for establishing or changing the gateway screen;

Figure 8 is a flow chart of the logic for pulling Internet content onto the ITV;

Figure 9 is a flow chart of alternate logic for pulling Internet content onto the ITV; and

Figure 10 is a flow chart of yet another alternate logic for pulling Internet content onto the ITV.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring initially to Figure 1, an interactive television (ITV) system is shown, generally designated 10. As show, the system 10 includes one or more content providers 12 that provide various types of content to one or more Web servers 14 (only one content provider 12 and one Web server 14 shown for clarity of disclosure). The Web server 14 accesses a content database 16 for storage of data therein. The content on the Web server 14 can be any appropriate content, including but not limited to hypertext markup language (HTML) pages, .jpeg and .gif image files, .avi and .mpeg movie files, audio files, streaming video, and so on.

In one preferred embodiment, the system 10 also includes an ITV system server 18, which can be, e.g., a Sony Corporation Web portal. The ITV system server 18 can be a Web server computer that accesses a customer database 20. As described further below, the customer database 20 can store customer or consumer profiles that can be used to tailor virtual channels to a profile. Essentially, a virtual channel is downloaded content that is given a number, like conventional TV channels, e.g., a channel number at the end of the sequence of available TV channels. A virtual channel, once its channel number has been selected by the consumer using a TV remote control device, is displayed as a Web page or series of Web pages on the below-described ITV. In one implementation, the content of the virtual channels is stored in memory that is on board the ITV and that is periodically updated via the Internet, or the vertical blanking interval (VBI) of a conventional TV signal. In another implementation, the

virtual channel content is stored remote from the ITV, e.g., at a Web server, and is streamed real-time to the ITV via a high-speed Internet access connection.

The servers 14, 18 of the present invention can be implemented by any appropriate computer, such as Internet server computers, personal computers, laptop computers, mainframe computers, and the like. The servers 14, 18 access software to execute portions of the present invention.

Plural consumer ITVs 22 (only a single ITV 22 shown for clarity) access the servers 14, 18 via the Internet 24. Also, each consumer ITV 22 receives television signals 26 from a source 28 of television signals. The source 28 can be plural broadcasters, or a cable television company, or a satellite dish, and so on. A conventional hand-held television remote control unit 30 can be manipulated by a consumer as the consumer views a display area 32 of the ITV 22 to input various selections to the ITV 22 in accordance with disclosure below. It will be appreciated that the remote control unit 30 is not a keyboard or keypad that is associated with a computer. Rather, it is a conventional remote TV control that has numeric buttons, up/down and left/right buttons, and a power button, as well as other buttons that might be conventionally provided on a TV remote control. The functions of the remote unit 30 can also be undertaken by conventional TV buttons on the ITV 22 itself. However, keyboards, keypads, motion-sensing (gesture) devices, and voice recognition input devices can also be used.

Now referring to Figure 2, the ITV 22 is shown. While the embodiment below discusses an ITV 22 with a single housing that supports not only the display

but also the microprocessor, virtual channel memory, and in general all of the electrical components shown in Figure 2, it is to be understood that the term "interactive television" encompasses any apparatus that has a television tuner and the below-described virtual channel capability. For instance, the term "ITV" encompasses the single-housing television shown in Figure 2, as well as a conventional television in combination with a set-top box that functions in accordance with the present invention. In the latter example, the set-top box might include, e.g., the microprocessor and memory discussed below.

As shown in Figure 2, the ITV 22 includes a housing 34 that holds a conventional television tuner 36. The TV tuner 36 receives the TV signals 26 and outputs them to a two-position switch 42, which in turn is controlled by a user interface 40 to output a consumer-selected TV channel (in a first position) or virtual channel (in a second position) to the display 32 of the ITV 22. It is to be understood that the user interface 40 can include an infrared receiver or other receiver for sensing remote control signals from the remote control 30. Also, the user interface 40 can include a visual portion, such as but not limited to a cursor that can be moved, by means of the remote control 30, across an electronic channel guide, Web page icon, and so on that are presented on the display 32, to enable a consumer to select a channel for display.

As mentioned above, not only can a consumer select a TV channel, but a virtual channel as well. In accordance with the present invention, a "virtual channel" is not a TV channel per se, but rather a Web-based channel that can be stored in a memory or other data storage 44 in the housing 34. That is, the

memory or other data storage 44 can be computer memory, or a hard disk drive, optical drive, solid state storage, tape drive, or any other suitable data storage medium.

A microprocessor 46 is also supported in the housing 34 to execute the logic steps set forth below, with the microprocessor 46, memory 44, TV tuner 36, and switch 42 all being accessible via an internal data bus 47. The microprocessor 46 assigns channel numbers to virtual channels or otherwise maintains a table of channel numbers versus TV channels and virtual channels. Accordingly, when, for instance, an electronic channel guide is displayed on the display 32 of the ITV 22, the virtual channels are listed, typically at the end of the guide after the conventional TV channels, by channel number and by name.

Alternatively, the virtual channels can be stored in a location remote from the ITV 22, e.g., they can be stored at the ITV system server 18, for display of the channels (upon consumer selection thereof) real-time via the Internet (or other network) when data transfer rates are sufficiently high to support such real-time transfer. In any case, the ITV 22 includes a modem 48 that communicates with the Internet 24. The modem 48 can be a cable modem, conventional twisted pair wire modem, DSL, wireless modem, or other appropriate communication device. It is to be understood that a single high data rate cable (e.g., either wire or optical fiber) can be provided to carry both Internet data and TV signals.

In any case, the modem 48 outputs a signal to a mixer 49, which can mix the Web-based signal from the modem 48 with related signals from the TV tuner 36. For instance, if a virtual channel of a cable newscast is selected, the Web-

based content can be combined with an actual broadcast newscast from the associated news station for simultaneous display of the newscast in a window of the virtual channel. The signal from the mixer 49 is sent to the switch 42 and thence to the display 32 when the user selects a virtual channel. The mixer 49 can be established by a "Geode" chip made by National Semiconductor. As mentioned above, one or more of the microprocessor 46, memory 44, modem 48, mixer 49, and switch 42 can be housed in a set-top box that is electrically connected to a separate television housing which houses the tuner 36 and display 32.

It may now be appreciated that the microprocessor 46 controls the functions of the ITV 22 in accordance with the logic below. The flow charts herein illustrate the structure of the logic modules of the present invention as embodied in computer program software. Those skilled in the art will appreciate that the flow charts illustrate the structures of logic elements, such as computer program code elements or electronic logic circuits, that function according to this invention. Manifestly, the invention is practiced in its essential embodiment by a machine component that renders the logic elements in a form that instructs a digital processing apparatus (that is, a computer or microprocessor) to perform a sequence of function steps corresponding to those shown. Internal logic could be as simple as a state machine.

In other words, the present logic may be established as a computer program that is executed by a processor within, e.g., the present microprocessors/servers as a series of computer-executable instructions. In

addition to residing on hard disk drives, these instructions may reside, for example, in RAM of the appropriate computer, or the instructions may be stored on magnetic tape, electronic read-only memory, or other appropriate data storage device.

Now referring to Figure 3, the overall logic can be seen. Commencing at block 50, real time TV signals 26 are received at the tuner 36. Assuming the ITV 22 is energized, at block 52 consumer channel selections are received by means of the user interface 40, and these channel selections are available to the microprocessor 46. Based on the selections, the microprocessor 46 controls the switch 42 to display the selected TV channel or virtual channel at block 54.

When a virtual channel is selected, the microprocessor 46 retrieves the associated Web page from the memory 44 for display of the channel. When the content of the virtual channel is stored at a Web server 14 that is remote from the ITV 22 (when, for instance, the ITV 22 has high speed Internet access), the microprocessor 46 retrieves the associated Web page directly from the particular server for display of the channel. Accordingly, in the preferred embodiment the ITV 22 can directly access Web servers 14 other than the ITV system server 18.

In accordance with the present invention, the virtual channels are not simply Web pages that remain static for the life of the ITV 22. Instead, they are periodically updated as the underlying Web pages on the respective Web servers 14 are updated. Accordingly, the logic moves from block 54 to block 56 wherein a DO loop is entered at either one or both of the Web server 14 and ITV system server 18. This DO loop can be entered periodically, or it can be entered in

response to a user-induced or automatically induced command from the microprocessor 46, sent via the Internet 24.

At decision diamond 58, it is determined, for each virtual channel, whether an update at the corresponding Web site has occurred. The determination at decision diamond 58 can be made by the server 14/18, assuming the server knows the current content of the virtual channels of the ITV 22 (normally the case when the virtual channels are stored at a server remote from the ITV), or it can be made by the microprocessor 46 (normally the case when the virtual channels are stored in the local memory 44). For instance, the server 14/18 can send information pertaining to the update to the microprocessor 46, which can then determine whether the memory 44 stores the latest version of the virtual channel under test. If it does, the logic loops back to block 56. In the event of an update, however, the logic moves to block 60 to download the entire new Web page or pages that establish the virtual channel or, more preferably to download only the changed portions thereof.

The download can be sent via the TV signal 26 in the VBI of the signal, or it can be sent via the Internet 24 (or other network) and modem 48 (by means of a DSL or cable modem line or wireless modem line) to the memory 44. In any case, the virtual channels are periodically updated.

Figure 4 shows the logic undertaken by the microprocessor 46 for establishing or changing what virtual channels are available to a particular ITV 22. Commencing at block 62, if it is desired to prompt the consumer for input, a prompt is displayed. The prompt can be displayed in a channel being viewed by

sending the prompt through the VBI of a viewed TV channel or through the Internet when viewing a virtual channel. Alternatively, user channel selections are recorded and used in developing a user profile.

Moving to block 64, the consumer's response is received. The response is ordinarily input by means of the remote control unit 30, although other input devices as discussed above can be used. Accordingly, a prompt might ask a consumer directly what types of virtual channels are of interest. Or, it might ask about the consumer's personal preferences on a number of topics, or about the consumer's personal demographics.

In any case, the response is stored in memory at block 66. Moving to block 68, the response is transmitted to one of the servers 14, 18 (typically to the ITV system server 18). The transmission is via the Internet, and it can be undertaken sometime after the consumer input is stored, e.g., during a low-usage time period. Alternatively, when the ITV 22 is continuously in communication with the Internet, the response can be sent immediately after it is received by the microprocessor 46, without first storing it.

Then, at block 70 a consumer profile can be constructed by the server 18 based on the consumer's responses, using models known in the art to predict what types of content the consumer might desire in the virtual channels of the ITV 22. At block 72, the profile is used to establish and/or alter the virtual channels of the ITV 22 by downloading new content via the VBI or modem 48.

Referring to Figure 5, the logic undertaken by the microprocessor 46 for presenting a gateway screen is shown. Commencing at block 80, a do loop is

entered wherein when the power to the ITV 22 is turned on or a gateway screen button is toggled, the following steps are performed. At block 82, the gateway screen is presented to the consumer through the display 32 of the ITV 22.

In a preferred embodiment, the gateway screen is intended to act as a starting point in accessing both television and Web-based content available through the ITV system 10. Due to the wide array of content available through the Internet 24 and the television signals 26, an initial reference point, e.g., the gateway screen, is very useful in allowing a consumer who is not extremely familiar with the Internet 24 and its content to access the information available through the ITV system 10. It is to be understood that the gateway screen can be the first screen displayed when the ITV 22 is activated or it can be the last screen displayed when the ITV 22 is de-activated. Moreover, the gateway screen can be displayed at any time while the ITV 22 is activated by toggling a gateway screen button, e.g., on the remote control unit 30.

Preferably, the gateway screen provides access to various information at a glance. This allows a consumer to gain a quick overview of the information presented by the multiple sources, e.g., the Web server 14, the ITV system server 18, or the television signal source 28. The gateway screen also allows a consumer to selected commonly accessed sources. Since the gateway screen is accessed frequently, it is preferred that the content for the gateway screen is cached in the memory 44 of the ITV 22 and updated often.

Continuing the description of the logic shown in Figure 5, at block 84, the consumer is allowed to interact with the ITV system 10 through the gateway

screen. It is to be understood that the consumer interacts with the system 10 by using the remote control unit 30 to move a cursor around on the gateway screen in order to further access information presented therein. Returning to the description of the logic, at decision diamond 86 it is determined whether no activity has occurred at the gateway screen for a predetermined time period, e.g., five seconds. If not, the logic moves to block 88 where the gateway screen is turned off. Thereafter the logic ends at state 90. If at decision diamond 86 there is activity at the gateway screen, e.g., the consumer is moving a cursor around to view different information and interact with the ITV system 10, the logic returns to block 84 and the logic continues as described above.

Referring now to Figure 6, an ITV unit, e.g., the ITV 22 described above is shown. An exemplary gateway screen is shown in the display area 32 of the ITV 22 . It is to be appreciated that the configuration of the gateway screen shown in Figure 6 is but one of many ways that the gateway screen can be configured. For example, Figure 6 shows that the gateway screen includes a television content panel 100, and an Internet content panel 102. Each panel 100, 102 presents content from a respective TV or Internet content provider, or combination thereof.

It is to be appreciated that when the content provider is a television channel source 28, the television content panel 100 displays the current broadcast video from the television signal 26, a portion of that video, or information derived from the television signal 26, e.g., information in the VBI or information included in the transport stream of a digital television signal. When the content provider is a

server, e.g., the Web server 14 or the ITV system server 18, the Internet content panel 102 can present Internet content directly, or derive information from the server and present the result.

It is also to be appreciated that the configuration of the gateway screen and the content provided thereby can be tailored for different situations, e.g., time of day or condition of access. As such, the gateway screen can have one set of content panels for system activation, one set of content panels for system de-activation, and different sets of content panels for different times of day. It is intended that the content panels 100, 102 serve as links to the respective content providers. Accordingly, a consumer can access a particular content provider through its respective content panel, e.g., by selecting the panel with a pointing device and issuing a selection/access command (in other words, a point and click process).

Additionally, a consumer can access a specific area of a particular content provider through a specific area of the respective content panel. For example, the TV content panel 100, can present the video content from a news broadcast without modification. If the consumer chooses the panel, e.g., by pointing and clicking, a full screen display of the broadcast channel is presented. Additionally, the Internet content panel 102, can present news headlines from one or more news Web sites and/or virtual channels. Again, if the consumer chooses the panel a full screen display of the Web site is presented. Moreover, choosing a specific headline causes the ITV system 10 to present the text corresponding to the headline or the section of the Web site corresponding to the headline.

Figure 7 shows the logic undertaken by the microprocessor 46 for establishing or changing the configuration of the gateway screen provided by the ITV 22. Commencing at block 110, a do loop is entered wherein if a gateway screen set-up button is toggled, e.g., on the remote control unit 30, the succeeding logic steps are performed. Proceeding to block 112, the consumer is prompted for input regarding gateway screen preferences. For example, the consumer may desire that the ITV system 10 present information pertaining to top news stories via the Internet content panel 102. Accordingly, a prompt might ask a consumer directly what types of web sites, or virtual channels relating thereto, are to be presented by the gateway screen. Thus, the consumer can input these preferences in response to the prompt presented at block 112. It is to be appreciated that the response to the prompt ordinarily is input by using the remote control unit 30.

In any case, the response is stored in memory at block 114. Moving to block 116, the response is transmitted to one of the servers 14, 18 (typically to the ITV system server 18). The transmission is via the Internet, and it can be undertaken sometime after the consumer input is stored, e.g., during a low-usage time period. Alternatively, when the ITV 22 is continuously in communication with the Internet, the response can be sent immediately after it is received by the microprocessor 46, without first storing it. Then, at block 118 the preferences input by the consumer are used to establish and/or alter the gateway screen of the ITV 22. As shown, the logic ends at state 120.

Accordingly, the ITV system server 18 provides content information for the gateway screen content panels 100, 102 that is customized, e.g., to particular television channels 26, particular Web servers 14, and/or particular virtual channels. In other words, a particular panel, e.g., the Internet content panel 102 can include a list of topics that are currently being discussed on other sources, e.g., news programs.

Referring to Figure 8, the logic undertaken by the microprocessor 46 for pulling Internet content onto the ITV is shown. Commencing at block 130, a do loop is entered wherein for each consumer the following steps are performed. At block 132, consumer usage is monitored to establish consumer access patterns. The patterns include TV channel access patterns and/or virtual channel (Internet) access patterns. Moving to block 134, the access patterns are recorded. At block 136, using the access patterns established above, future access times and access targets are predicted. Thereafter, at block 138, content is downloaded to the consumer ITV 22 before the predicted access times. For example, if a consumer establishes a pattern of downloading news content to the ITV 22 at seven ante meridiem (7:00 a.m.), the ITV system 10 will recognize this pattern and download the news content to the ITV 22 slightly before 7:00 a.m. so that the consumer will not have to wait to receive the content at the predicted download time. Or, if the consumer accesses a TV news station, a virtual channel displaying an Internet news site can be updated for viewing by the established viewing time.

Figure 9 shows alternate logic undertaken by the microprocessor 46 for pulling Internet content onto the ITV. Commencing at block 140, a do loop is

entered wherein for each consumer the following steps are performed. At block 142, consumer usage is monitored to establish start-up and shut-down patterns. Moving to block 144, the start-up and the shut-down patterns are recorded. Using the start-up and shut-down patterns established above, at block 146, future start-up and shut-down times are predicted. Thereafter, at block 148 content for the gateway screen is downloaded to the consumer ITV 22 before a predicted start-up time or shut-down time. Thus, the time that the consumer has to wait to receive an up-to-date gateway screen at start-up or shut-down is minimized.

Figure 10 shows yet another alternate logic undertaken by the microprocessor 46 for pulling Internet content onto the ITV. Commencing at block 150, a do loop is entered wherein for each consumer the following steps are performed. At block 152, consumer content requests are monitored to establish request patterns. Moving to block 154, the request patterns are recorded. Proceeding to block 156, future request times are predicted using the request patterns established above. Thereafter, at block 158 the consumer is prompted to accept the content before the predicted request time. Moving to decision diamond 160, it is determined whether the consumer wishes to accept the content. If so, at block 162, the content is downloaded. If not, the logic ends at state 164.

While the particular SYSTEM AND METHOD FOR PULLING INTERNET CONTENT ONTO INTERACTIVE TELEVISION as herein shown and described in detail is fully capable of attaining the above-described objects of the invention, it is to be understood that it is the presently preferred embodiment of the present invention and is thus representative of the subject matter which is broadly

contemplated by the present invention, that the scope of the present invention fully encompasses other embodiments which may become obvious to those skilled in the art, and that the scope of the present invention is accordingly to be limited by nothing other than the appended claims, in which reference to an element in the singular means "at least one". All structural and functional equivalents to the elements of the above-described preferred embodiment that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the present claims. Moreover, it is not necessary for a device or method to address each and every problem sought to be solved by the present invention, for it to be encompassed by the present claims. Furthermore, no element, component, or method step in the present disclosure is intended to be dedicated to the public regardless of whether the element, component, or method step is explicitly recited in the claims.

WE CLAIM:

CLAIMS

1. A method for providing Internet content via an interactive television system (10), comprising the acts of:

monitoring usage of the interactive television system (10);

establishing content access patterns for at least one consumer;

predicting at least one access time at least partially based on the content access patterns; and

downloading content based on the predicted access time.

2. A method for providing Internet content via an interactive television system (10), comprising the acts of:

monitoring usage of the interactive television system (10);

establishing usage patterns for at least one consumer;

predicting at least one time of usage at least partially based on the usage patterns; and

downloading content relevant to the usage based on the predicted time of usage.

3. The method of Claim 2, wherein usage by the consumer is monitored to establish content access patterns and the method further includes the acts of:

predicting at least one access time at least partially based on the content access patterns; and

downloading content based on the predicted access time.

4. The method of Claim 2, wherein usage by the consumer is monitored to establish start-up patterns and the method further includes the acts of:

predicting at least one start-up time at least partially based on the start-up patterns; and

downloading content relevant to a gateway screen (100, 102) based on the predicted start-up time.

5. The method of Claim 2, wherein usage by the consumer is monitored to establish shut-down patterns and the method further includes the acts of:

predicting at least one shut-down time at least partially based on the shut-down patterns; and

downloading content relevant to a gateway screen (100, 102) based on the predicted shut-down time.

6. The method of Claim 2, wherein usage by the consumer is monitored to establish request for content patterns and the method further includes the acts of:

predicting at least one future request time based at least partially on the request for content patterns; and

prompting the consumer to accept content based on the predicted request time.

7. The method of Claim 6, further comprising the act of:

if the consumer accepts the prompt, downloading content.

8. An interactive television system (10), comprising:

at least one Web server (14) having Internet content stored therein;

at least one interactive television system server (18); and

at least one interactive television (22), the interactive television (22) receiving Internet content at least from the Web server (14), the interactive television system server (18) including a program for downloading Internet content to the interactive television (22) at predicted times.

9. The system (10) of Claim 8, wherein the program includes:

logic means for monitoring usage of the interactive television system (10) by at least one consumer;

logic means for establishing usage patterns by the consumer;

logic means for predicting at least one time of usage at least partially based on the usage patterns; and

logic means for downloading content relevant to the usage based on the predicted time of usage.

10. The system (10) of Claim 9, wherein usage by the consumer is monitored to establish content access patterns and the program further includes:

logic means for predicting at least one access time at least partially based on the content access patterns; and

logic means for downloading content based on the predicted access time.

Fig. 1
ITV System

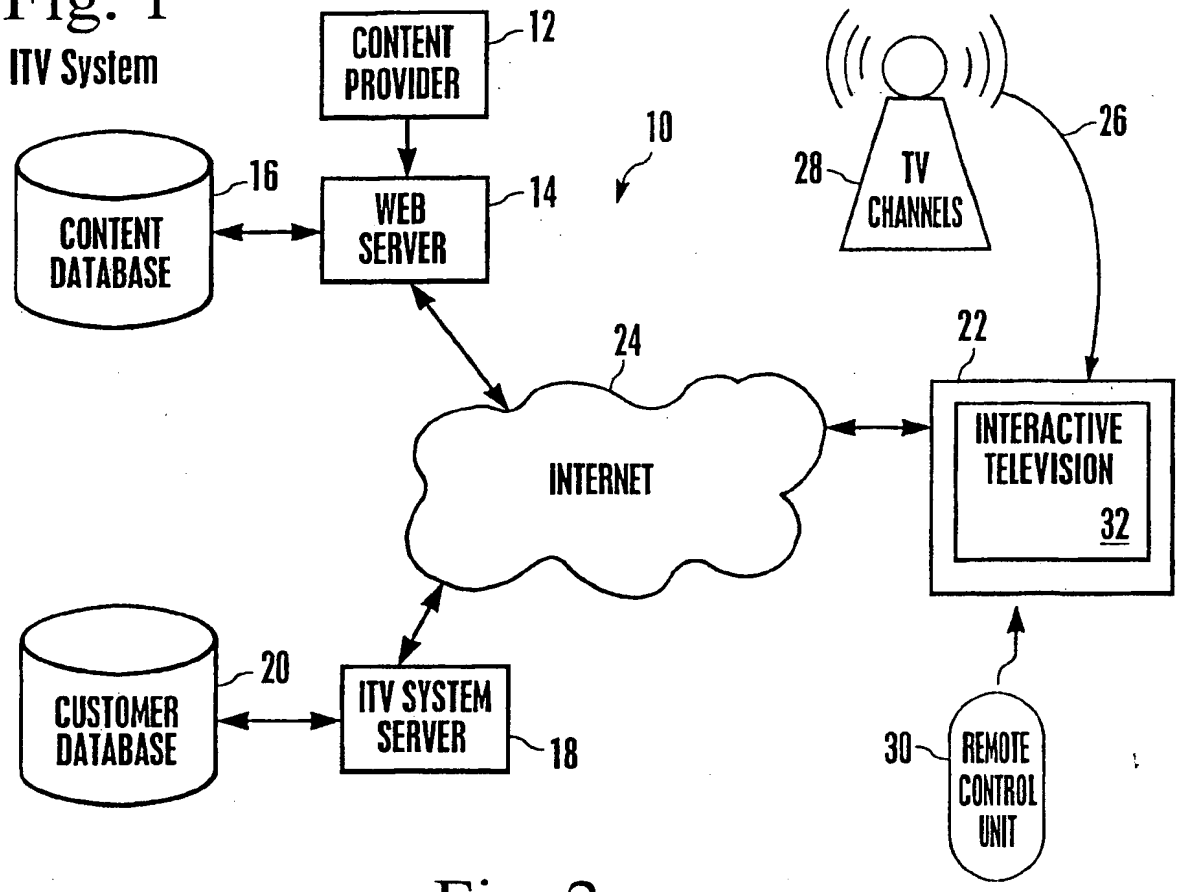
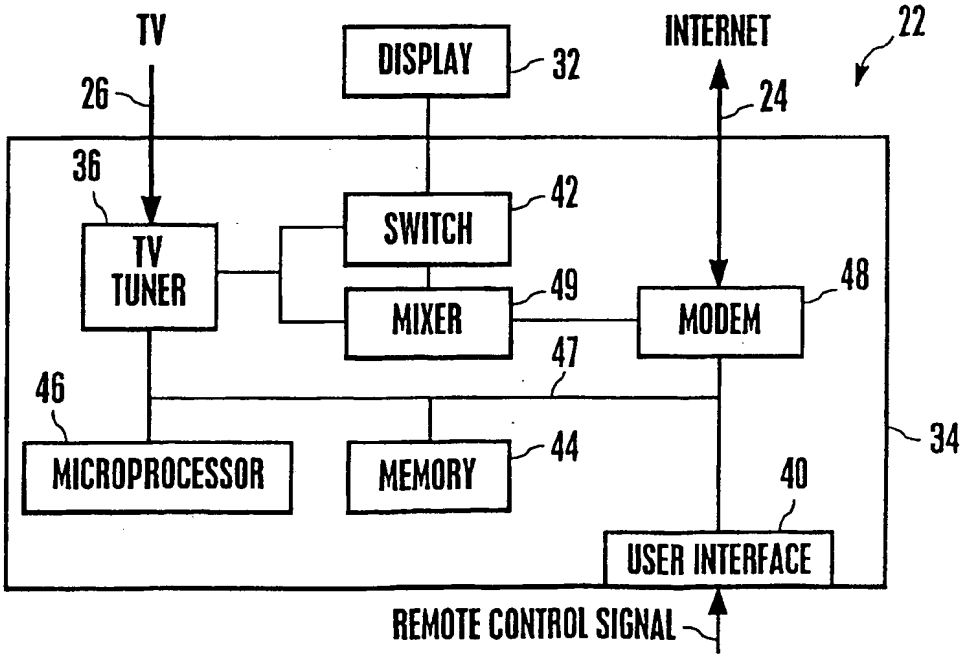


Fig. 2
ITV Set



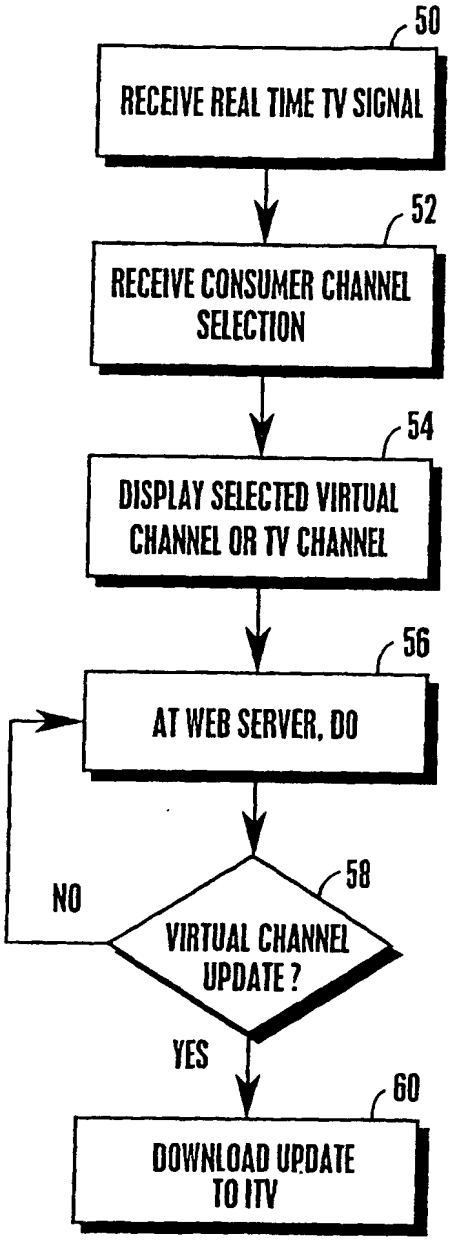


Figure 3

OVERALL METHOD

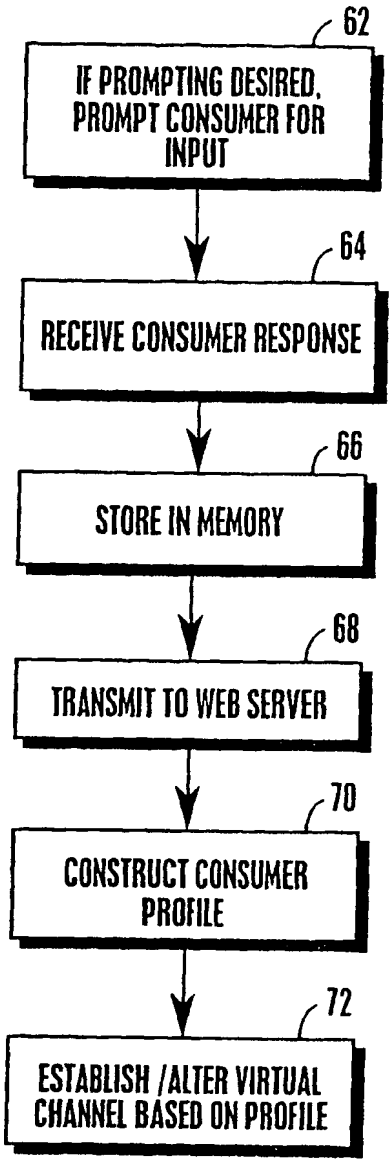


Figure 4

ESTABLISHING CONSUMER PROFILE

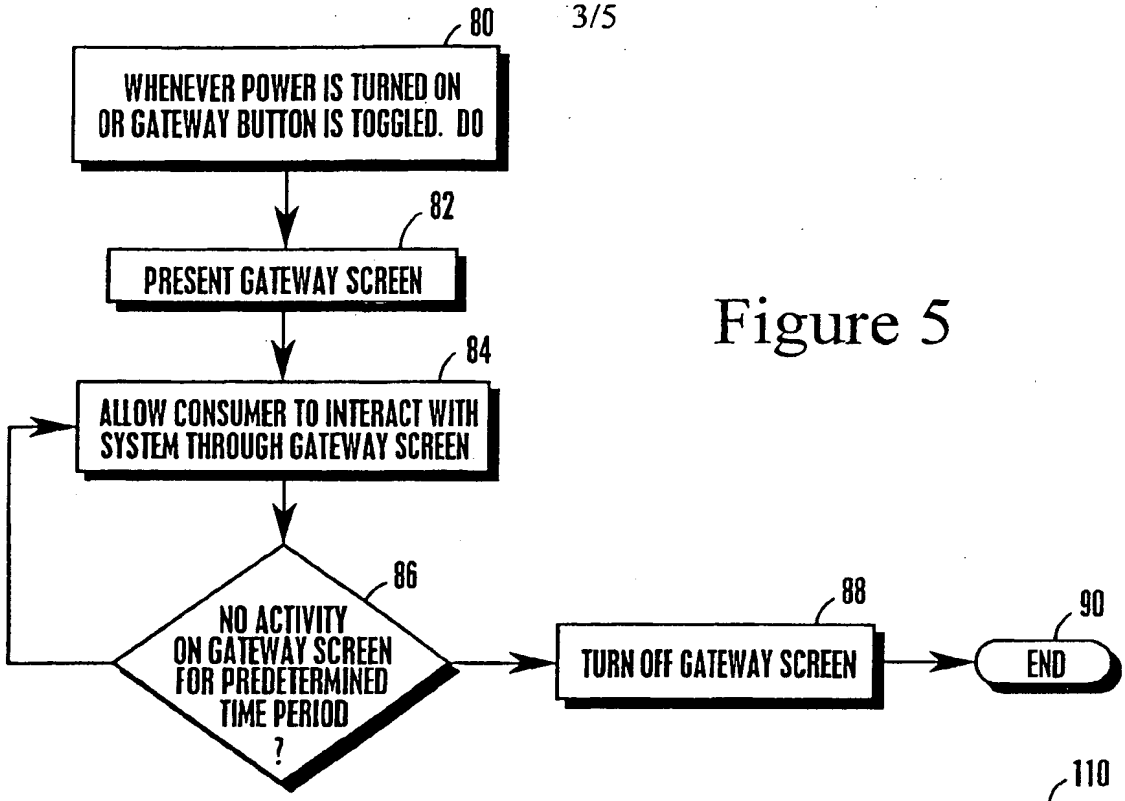


Figure 5

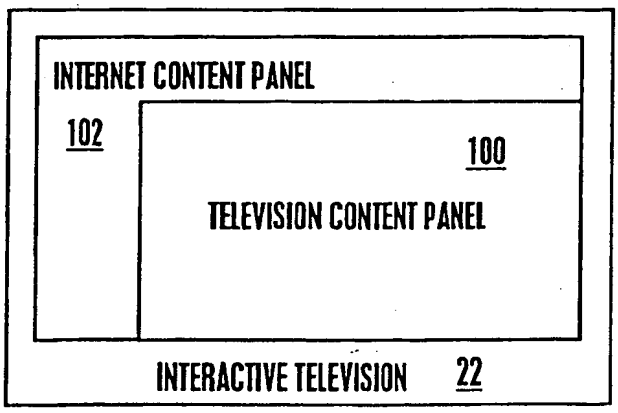


Figure 6

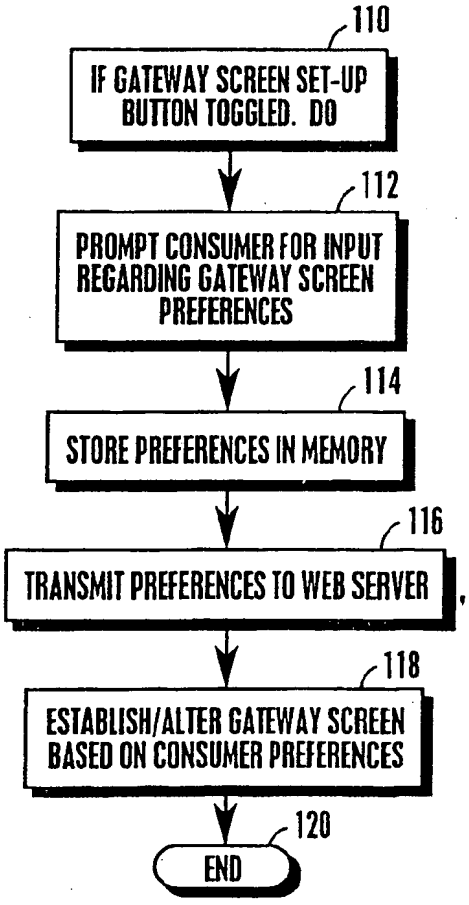


Figure 7

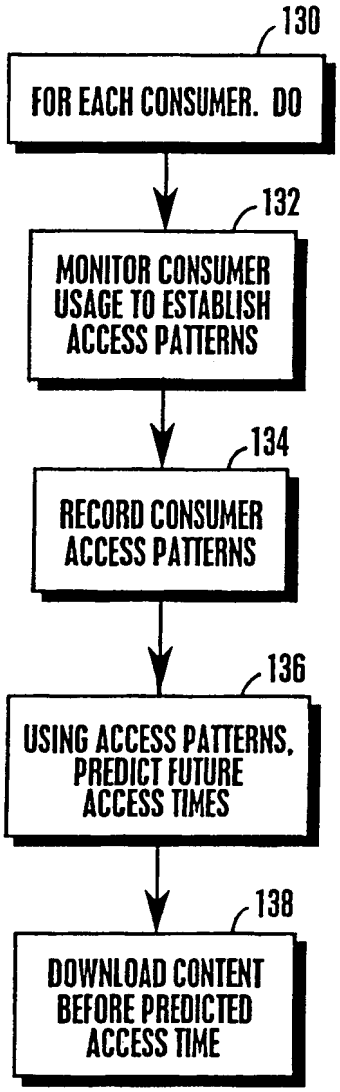


Figure 8

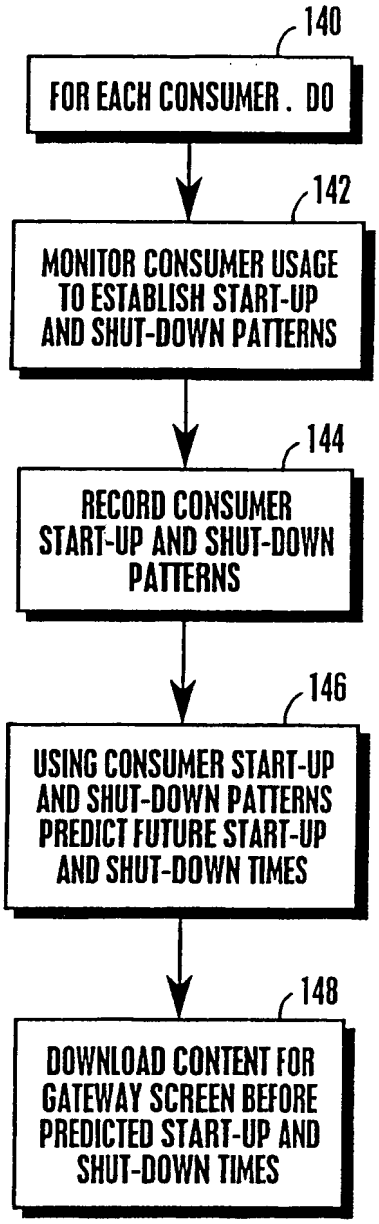


Figure 9

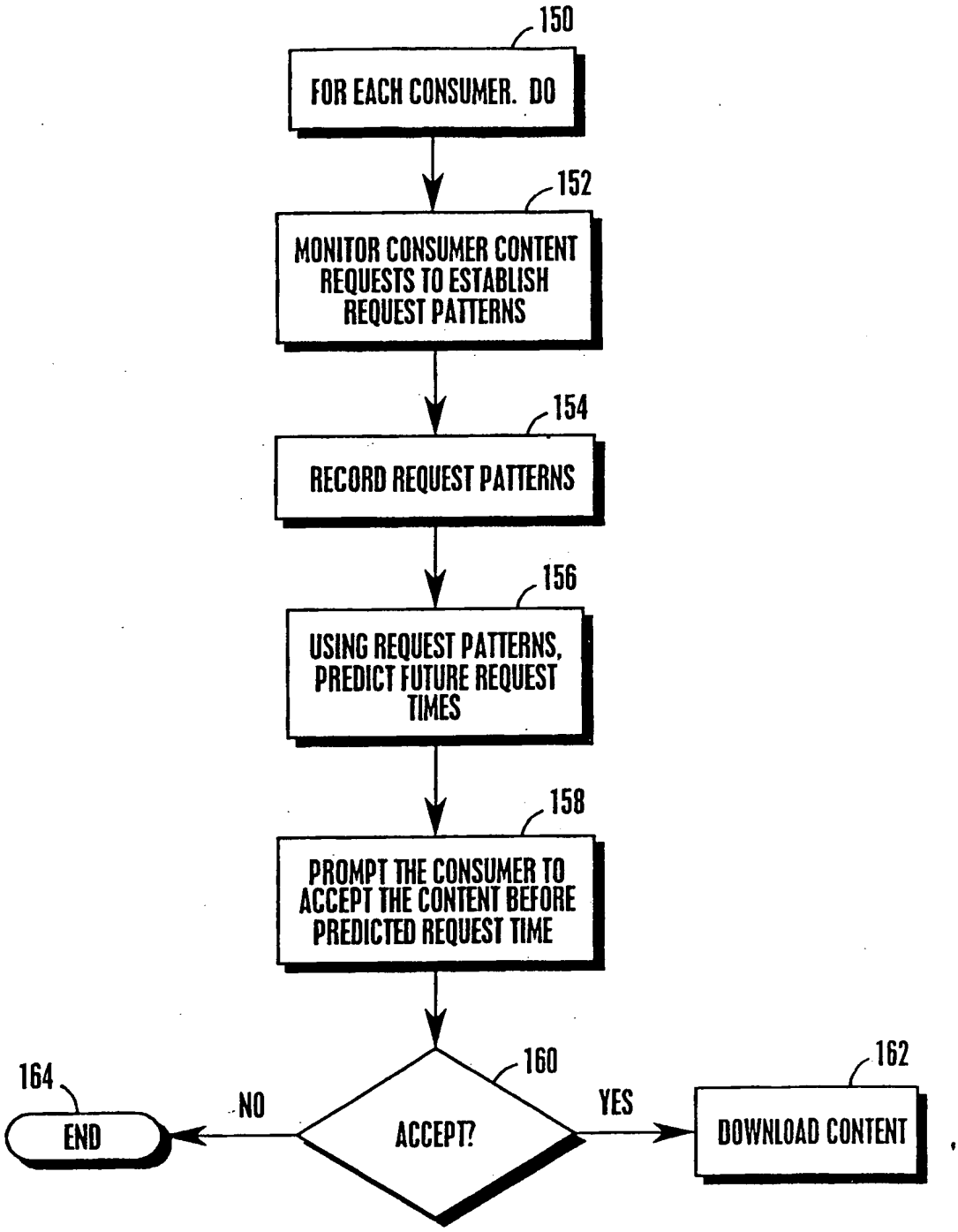

150
FOR EACH CONSUMER. DO
152
MONITOR CONSUMER CONTENT REQUESTS TO ESTABLISH REQUEST PATTERNS
154
RECORD REQUEST PATTERNS
156
USING REQUEST PATTERNS, PREDICT FUTURE REQUEST TIMES
158
PROMPT THE CONSUMER TO ACCEPT THE CONTENT BEFORE PREDICTED REQUEST TIME
160
ACCEPT?
NO
YES
164
END
162
DOWNLOAD CONTENT

Figure 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/12379

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :H04N 7/16
US CL :725/14
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 725/14-20, 46, 86, 91-93; H04N 7/16, 7/173

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,758,257 A (HERZ et al.) 26 May 1998 figures 1-2, column 4, lines 17-57, column 5, lines 23-33, column 6, lines 14-35, columns 9-10, column 22, lines 7-55, column 25, lines 7-15, column 28, lines 47-57.	1-7,9,10
X -- Y	US 5,926,207 A (VAUGHAN et al.) 20 July 1999 column 1, lines 35-43, column 3, lines 34-54.	8 --- 1-7,9,10
A	US 6,061,082 A (PARK) 09 May 2000 whole document	1-10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 10 JUNE 2002	Date of mailing of the international search report 08 JUL 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHRISTOPHER GRIGERA Telephone No. (703) 305-4755

Form PCT/ISA/210 (second sheet) (July 1998)*

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/12379

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

EAST:
search terms: predict$3 or determin$4 or calculat$3, usage, view$3, watch$3, time, Internet or web,monitor$3 or survey$3, download$3, access near4 time ,

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